The AP shall evaluate the BSSs indicated in the BSS Transition Candidate List Entries field in the latest BSS Transition Management Query frame or BSS Transition Management Response frame received from the non-AP STA as BSS transition candidate(s) for the non-AP STA. The means by which the AP evaluates and determines BSS transition candidates is outside the scope of this specification.

[0146] A non-AP STA that receives the Abridged bit with a value of 1 shall treat any BSSID in the current ESS that does not appear in the BSS Transition Candidate List as if it were present in the BSS Transition Candidate List with a Preference value of 0.

B. STA Identification And State Information To ANQP Server

[0147] When an access point receives a query from an associated and authenticated STA for information on candidate wireless networks, the existing IEEE 802.11 standard does not enable the AP to forward the query as an ANQP query to an ANQP server, but instead, provides the alternative BSS Transition Management Query as the protocol for such use. The Standard provides the ANQP query for use by an access point to forward queries only from unassociated STAs.

[0148] The problem with the ANQP based approach is that it is designed for cases in which a requesting STA is in the unassociated/unauthenticated state. When an AP receives an ANQP request from a STA, it passes the request to the ANQP server to which it is connected and the ANQP server processes the request assuming that the STA is in the unassociated/unauthenticated state. Typically service request processing depends on whether the request originates from a reliable source (authenticated/associated STA) or from an unknown/unreliable source (unauthenticated/unassociated STA). This is also case with BSS selection requests. On the other hand, the objective is to have means to give one and same guidance on BSS selection to an authenticated and associated STA regardless of whether the STA uses the ANQP based protocol or the BSS Transition Management protocol.

[0149] It would be beneficial to have the same type of ANQP query and ANQP response for both associated STAs, as well as unassociated STAs.

[0150] In accordance with an example embodiment of the invention, when an AP receives from an associated and authenticated STA, an ANQP request that relates to candidate wireless networks, the AP forwards a BSS candidate query to the ANQP server and indicates to the server that the request is originated by an authenticated and associated STA. The AP may also provide further detailed information about the originating STA, such as the MAC address of the STA, or a subscription identifier related to the originating STA.

[0151] In accordance with an example embodiment of the invention, when an ANQP server that receives from the AP, the BSS candidate query on candidate wireless networks, the ANQP server checks whether the query contains information about the state, and optionally the identification, of the STA that originated the query. Those BSS candidate queries that indicate that they are originated by associated/authenticated STAs, are processed separately from other BSS candidate queries that indicate that they are originated by unassociated/unauthenticated STAs. If there is no indication on the state in the BSS candidate query, the query is processed as if the query were originated by an unassociated/unauthenticated STA.

[0152] FIG. **1** illustrates an example wireless network of an access network query (ANQP) protocol server **120** that receives status reports from several wireless access point devices **110**A, **110**B, and **110**C, each managing a respective wireless network. Each access point device reports its status to the ANQP server, such as message traffic load, bit error rate, response times, and other performance metrics and services and applications available on its wireless network, which the ANQP server may store for characterizing each available network, in accordance with at least one embodiment of the present invention. Additionally, the ANQP server maintains information on location of each access point device or at least their relative position with respect to each other, in order to determine which access point devices are neighbors to each other. The ANQP server may use all this information about characteristics and relative positions of each available network, when giving guidance on BSS selection in the form of candidate wireless networks, in accordance with at least one embodiment of the present invention.

[0153] FIG. **1**A illustrates the example wireless network of FIG. **1**, wherein a wireless device (STA) **100** is associated to an access point device **110**A. The wireless device transmits to the access point device, a wireless ANQP request message **130** that includes a BSS query, requesting information on candidate wireless networks, in accordance with at least one embodiment of the present invention. An example of the wireless ANQP request message **130** is shown in greater detail in FIG. **3**A.

[0154] FIG. **1**B illustrates the example wireless network of FIG. **1**A, wherein the access point device **110**A determines whether the requesting wireless device **100** is associated and authenticated with the access point device. The access point device composes a BSS query forwarding message **132** that includes information from the ANQP wireless request message **130**. If the wireless device **100** is associated to and authenticated to the access point device **110**A, then the access point will include in the forwarding message **132**, an indication that the wireless device is associated with the access point device. The indication may be the state of the wireless device STA_STATE and the identity of the wireless device STA_ID. The figure shows the access point **110**A transmitting the BSS query forwarding message **132** to the ANQP server **120** over the backbone network **60**, and including in the forwarding message the indication that the wireless device is associated with the access point device, in accordance with at least one embodiment of the present invention. The AP may also provide further detailed information about the originating STA, such as the MAC address of the STA, or a subscription identifier related to the originating STA. An example of the backbone network frame for the BSS query forwarding message **132** is shown in greater detail in FIG. **3**B.

[0155] In an example embodiment of the invention, a BSS candidate query **132** from an AP to the ANQP server **120** has an optional element/set of fields, which are present in the message **132** only when the BSS candidate query is transmitted due to an ANQP query related to BSS selection received from an associated/authenticated STA. On default all ANQP queries **130** transmitted to an AP by a STA that has no association/authentication relationship to the AP, are